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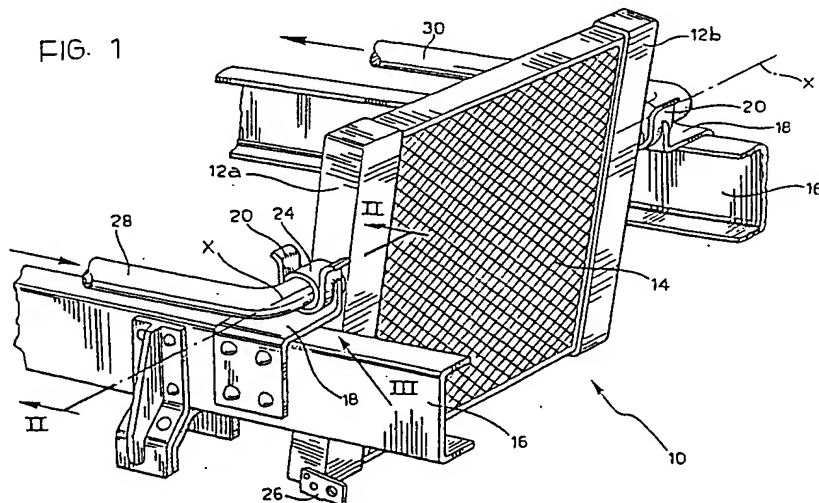
(56) Documents cited
GB 1516057 US 3297080
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(58) Field of search
B7H
Selected US specifications from IPC sub-class B60K

(54) Motor vehicle having a tilting
radiator

(57) Plastic manifolds 12a, 12b are
unitary with two tubular projections 22
acting as inlet and outlet to the radiator
10 and also operative as pivots which
enable the radiator to be turned around
a horizontal axis X-X during assembly of
a motor vehicle.

FIG. 1



- 5 1 2 8 8

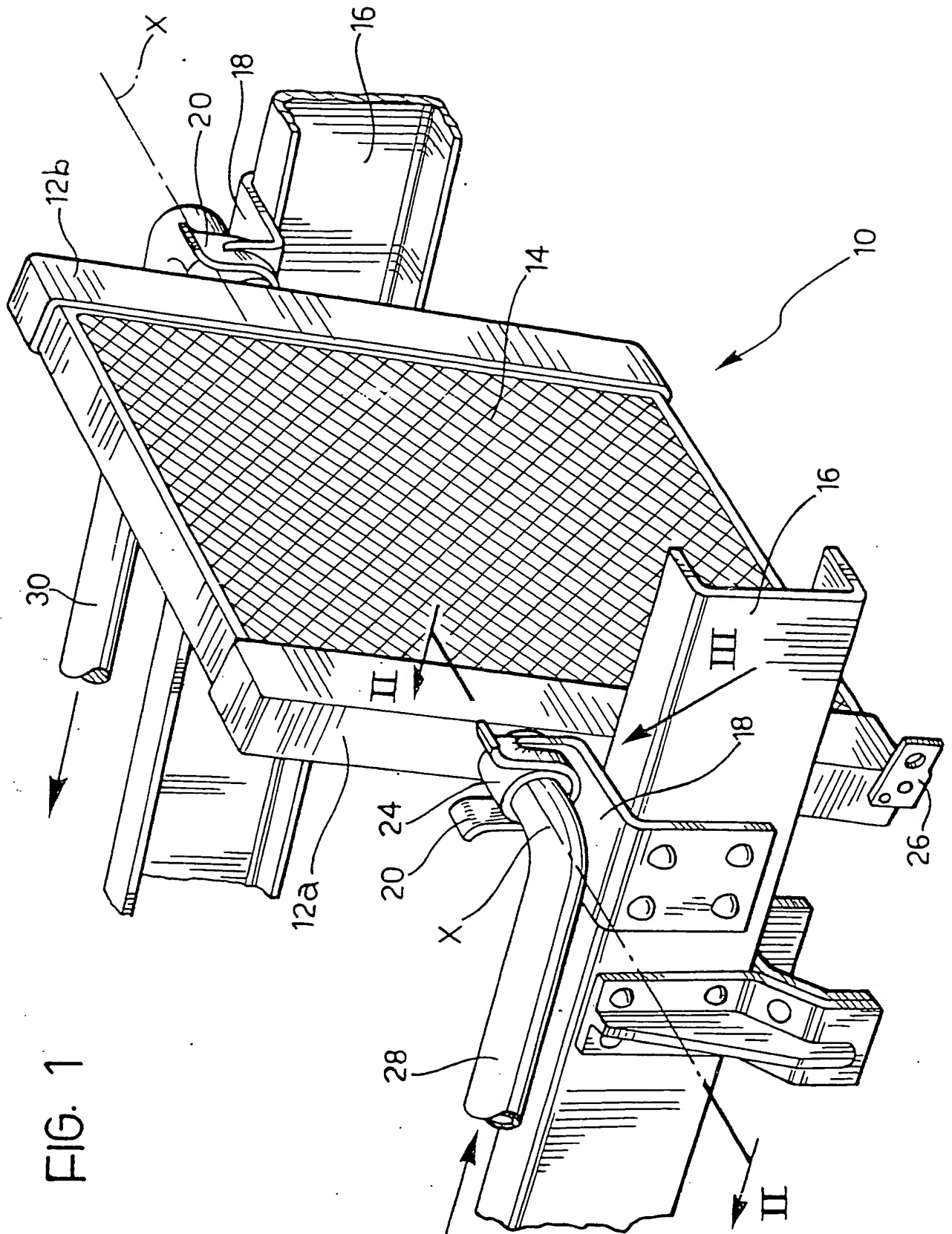


FIG. 1

FIG. 2

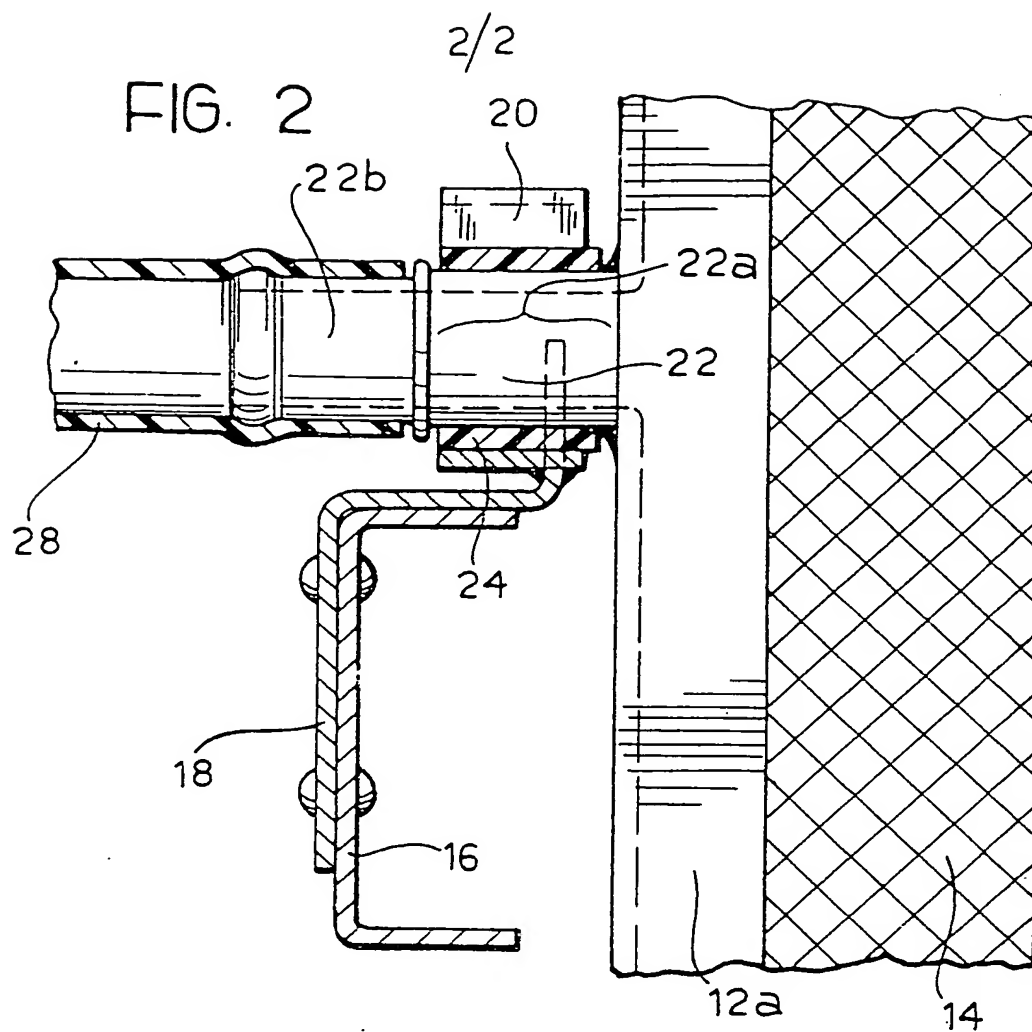
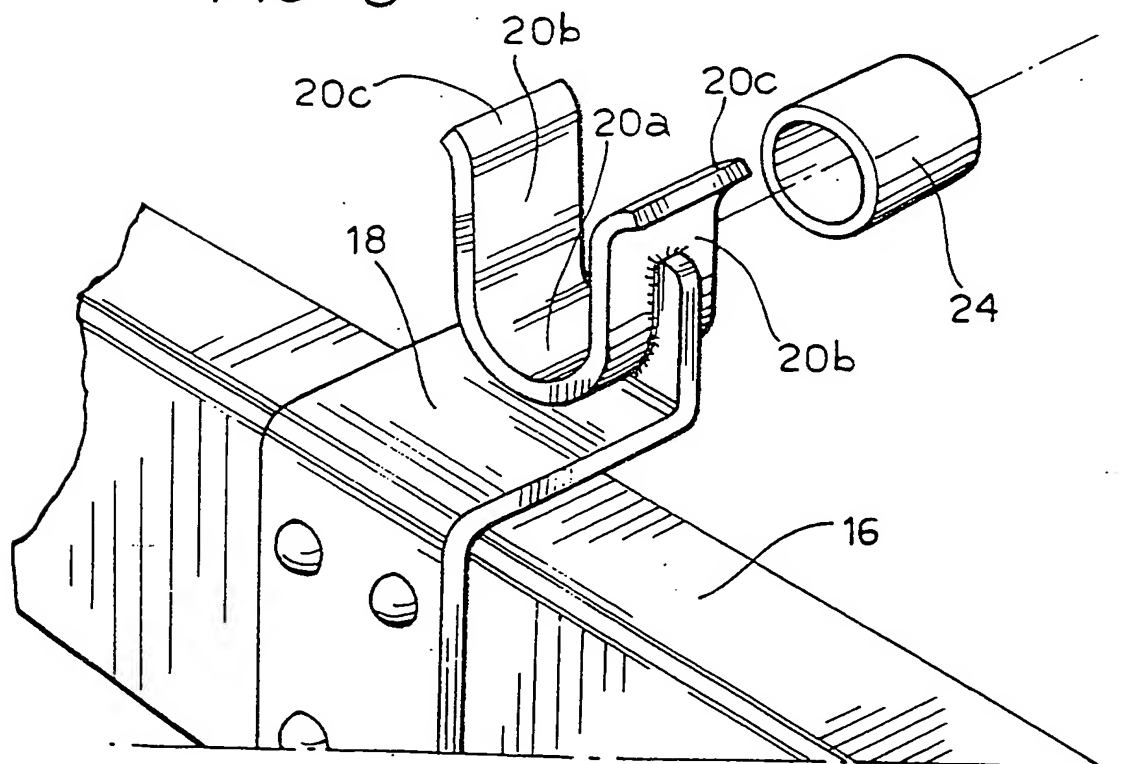


FIG. 3



SPECIFICATION

Motor vehicle having a tilting radiator

5 This invention relates to a motor vehicle having a liquid-cooled internal combustion engine having a radiator, means for connecting the same to the vehicle structure and inlet and outlet connections for a liquid coolant.

10 Conventionally, more particularly in industrial vehicles, the kind of radiator varies with the kind of vehicle in which the radiator is fitted. Some radiator parts, for example, the honeycomb between the manifolds, are the same for every vehicle but other parts, for example, the manifolds, must be purpose designed and built for a vehicle, more particularly as regards the positioning of the radiator in the vehicle.

Consequently, a particular kind of radiator must be devised for each kind of vehicle, with the result of high design and production costs and spares control problems.

Also, known radiators are often difficult to fit since in addition to the radiator body being connected to the vehicle structure, the radiator has to be connected to the cooling circuit by way of coolant inlet and outlet connections which are often in difficultly accessible positions.

It is the object of this invention to provide a motor vehicle which is free from the disadvantages mentioned and makes for greater standardization of components for different kinds of vehicles and which has a radiator which is very simple to instal and which is easy and cheap to construct.

According to the invention, the means for connecting the radiator to the vehicle structure comprise pivots for pivotally connecting the radiator to the vehicle structure so that the radiator can oscillate around a substantially horizontal axis; and the coolant inlet and outlet connections are disposed near the pivots.

Consequently, a single type of radiator can be adapted to different kinds of vehicle having different chassis and different forms of power unit just by varying the inclination of the radiator by rotating the same around its axis while the radiator is being installed in the vehicle. Also, the construction of the usually plastics manifolds and the assembly of the coolant hoses are simplified.

Other advantages and features of the vehicle according to the invention will become apparent from the following detailed description given purely by way of non-limitative example with reference to the accompanying drawings wherein:

Figure 1 is a perspective view of a radiator according to the invention;

Figure 2 is a view in section on the line II-II of Figure 1, and

Figure 3 shows a detail to an enlarged scale and in an exploded form of Figure 1.

Referring to the drawings, a radiator 10 for an industrial vehicle has two manifolds 12a, 12b, cooling liquid arriving from the engine in the manifold 12a and cooled liquid returning to the engine by way of the manifold 12b. Disposed between the two manifolds 12a and 12b is a honeycomb 14 of finned tubes

providing a liquid-air heat exchange. Two longitudinal members 16 form part of the vehicle chassis or frame. Secured to the top of each member 16 is a support 18; connected thereto is a saddle 20 having a bearing or support part 20a, two walls 20b and two entry parts 20c.

The plastics manifolds 12a, 12b are unitary with two tubular projections 22 operative as pivots which enable the radiator 10 to be turned around a horizontal axis X-X during assembly. The manifold 12a also has a plate or bracket or the like 26 enabling the radiator 10 to be secured at the predetermined inclination.

Each projection 22 communicates with the interior of each manifold and is carried by the saddle 20 with the interposition of an elastomeric anti-vibration bush 24. Also, each projection 22 has a part 22a near the associated manifold and an end part 22b connected coaxially with a hose 28, 30 for the arrival and despatch respectively of the coolant.

When the radiator 10 is being fitted in the vehicle, the bushes 24 are first threaded on the parts 22a of the projections 22, whereafter the radiator 10 is installed between the members 16 by the projections 22 being introduced vertically into the saddles 20, such introduction being facilitated by the entry parts 20c. The radiator 10 is then turned around the axis X-X to take up the required inclination. After the radiator has been secured in position by means of the plate or bracket or the like 26, the respective coolant inlet and outlet tubes 28, 30 are connected to the parts 22b of the projections 22.

Advantageously, the projections 22 can be unitary with the manifolds 12a, 12b, for example, by being produced by forming.

CLAIMS

1. A motor vehicle having a liquid-cooled internal combustion engine having a radiator, means for connecting the same to the vehicle structure and inlet and outlet connections for a liquid coolant, characterised in that the means comprise aligned pivots for pivotally connecting the radiator to the vehicle structure so that the radiator can oscillate around a substantially horizontal axis; and the coolant connections are disposed near the pivots.

2. A vehicle according to claim 1, characterised in that the pivots are borne by a pair of support saddles secured to the vehicle structure and operative as companion elements to the pivots.

3. A vehicle according to claim 2, characterised in that antivibration elements in the form of elastomeric bushes are interposed between the pivots and the respective saddle.

4. A vehicle according to any of the previous claims in which the radiator has two manifolds disposed opposite one another, characterised in that each pivot is in the form of a tubular projection integral with the associated manifold and adapted for connection to a coolant hose.

5. A vehicle substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

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